

Mitigating adverse sexual and reproductive health outcomes through a comprehensive primary school sexuality education program in South-Western Uganda’.

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Time period: April 2015 to December 2018

Funding channel: Flemish University Development Cooperation (VLIR-OUS)

Total Budget: Euros 299,924

Version 3 November 2016

I. Project Description

Adolescent sexual and reproductive health is a major public health concern in Uganda and many countries around the globe. This project seeks to contribute to this developmental problem by tackling it at the roots: while most ASRH interventions focus on older adolescents that are already sexually active, our project takes a step back and addresses young adolescents before they become sexually active.

The overall project objective is to improve adolescent sexual and reproductive health (ASRH) through comprehensive sexuality education for young adolescents in South Western Uganda using a university student outreach programme. Firstly (IR1), we assess the gaps in SRH

education using mixed methods. Second (IR2), we will develop an interdisciplinary ASRH school model with integrated gender-perspective for young adolescents in primary schools. This model builds on existing initiatives (UNESCO, IPPF, Rutgers WPF) and will be implementing by interdisciplinary teams (biomedical and gender studies students) within the framework of the existing university students outreach programme of Mbarara University. Thirdly (IR3), the development and implementation will be closely monitored to identify enabling and hindering factors, and the effectiveness of the ASRH school model will be studied. Finally (IR4), the findings will be disseminated. The project is innovative for two main reasons. 1) It focuses on young adolescents: even though the stage of early adolescence is one of the most crucial phases of human development, it is often overlooked in SRH research. 2) The project pays specific attention to the process of development and implementation of a comprehensive SRH program. While effectiveness studies have been done on this topic, good process and implementation research is very rare. Nevertheless, it is crucial for the advancement of the study field.

This project also provides a collaborative platform between stakeholders in the Gender and Women Studies Department at MUST and the International Centre for Reproductive Health (ICRH) at the University of Ghent and the Center of Expertise on Gender, Diversity and Intersectionality (RHEA) at the Free University of Belgium as all parties benefit from the collaborative research which will lead to joint PhDs and publications in the field of adolescent health.

II. Background and Relevance

Currently, there is hardly any standardized sexuality education curriculum for primary school students in Uganda (Darabi, Leila, et al., 2008). The sexual education programs which are in place are often for secondary education and the out of school adolescents. In Uganda, only about half of sexually active 15-19 year olds have ever received any kind of sexual education in school (Darabi, et al., 2008). The education factor clearly impacts sexual behavior, with the average age of first sexual encounter rising to 18.1 for women and 18.3 for men for those who have attained secondary level education. The average age of first sexual encounter between men (18.2) and women (16.2) with no education, and men (18.0) and women (16.3) who have attained primary school is nearly the same, whereas the average age of first sexual encounter for those with secondary education increases dramatically only for girls (UDHS 2012).

A research project involving Uganda and other Sub-Sahara African countries identified three core positive outcomes for adolescents health interventions: delayed sexual initiation, risk reduction for sexually active youth and reduced incidence of pregnancy or STIs (Advocates for Youth 2005). However, among all researched countries there was no evidence of intention to continue intervention since most of the researched outcomes were not studied on a long-term in scope, and the study process did not offer a consistent approach to sexuality education. Uganda implements a school health program under the ministry of Education providing comprehensive preventive and health promotion services to school going children (5-24years). The main purpose of the most research intervention is to improve sexual and reproductive health of school children. The efforts however have not been sufficient as AIDS and other sexual and reproductive health problems continue to pose a serious threat to young people.

Uganda's sexual and reproductive health trends undoubtedly indicate that primary school is a critical stage at which interventions would arguably have the most profound impact in the long-term. With the advent of universal primary education, access to primary school for students is far more accessible than secondary school, which remains out of reach for many. On average, 85% of urban children and 80% of rural children enroll in primary school, revealing the high level of access to primary education (Uganda Demographic and Health Survey (UDHS) 2011). However, 68% of children who enroll for primary education drop out of school before reaching the last grade. Uganda's primary school dropout rate is the second highest in Sub-Saharan Africa, where more than 2 out of 3 children starting primary school are expected to drop out before reaching primary seven (UNESCO 2012). The transition between primary and secondary school reveals a sharp drop off in attendance rates across the region with a particular discrepancy for rural areas. In urban areas, 34.7% of students continue with secondary school, whereas in rural areas only 14% of students continue on. Access to secondary school also suffers from a gendered divide. Only 12.6% of young men continue with secondary school, compared to the 15.5% of young women who continue in rural areas. In urban areas this gender divide is flipped, with 39.7% of young men continuing on to secondary school, compared to just 31% of young women (UDHS 2011).

This research uses an intervention approach to address this gap through implementing a long-term and consistent approach for a sexuality education program for young adolescents attending

primary school in South-Western Uganda. The program will be implemented as part of the Community Based Education program of Mbarara University of Science and Technology (MUST). After a baseline survey, a sexuality education curriculum will be designed by the study investigators in partnership with all relevant stakeholders. The sexuality education curriculum will be adapted to already tested SRH education models and sexuality education guidelines that have worked in Uganda. Through the Community Based Education program, university students will be grouped in interdisciplinary teams which will include biomedical and gender studies students of MUST. The implementation will be supervised by a team of 2 to 3 jointly supervised PhD students conducting their academic research on the project.

This is an initiative that is spearheaded by the Department of Gender and Women Studies and the Community Based Education (CBE) Program, Mbarara University of Science and Technology (MUST). University students of MUST will be teamed up in interdisciplinary teams comprising of gender and biomedical medical students to deliver comprehensive sexuality education programs to adolescents in selected primary schools in South-Western Uganda.

III. Problem analysis

Uganda's adolescents experience unfavorable outcomes resulting from inadequate sexual and reproductive health information and risky sexual practices. Young people (10-24 years) constitute over 33.5% of Uganda's population, with about 47% below the age of 15 (UBOS 2012). Nevertheless, this age group carries the highest disease burden, particularly in the sexual and reproductive health area. Trends indicate that young people continue to account for half of HIV/AIDS new infections, with signs of increased risky sexual behaviours (Kibombo et al 2008, UNAIDS 2013). In Uganda, young people suffer from negative sexual and reproductive health outcomes such as unintended pregnancies, unsafe abortion, maternal mortality, sexually transmitted infections (STIs), HIV/AIDS, exploitation, sexual violence against young women and girls, increasing number of adolescents with prenatally acquired HIV, and poor nutrition (Baryamutuma and Baingana 2011). There are higher rates of STIs and HIV infection with adolescents than in the general population (MOH, 2009), and about 2.1 million adolescents are known to be living with HIV in Uganda today (UBOS 2012). According to the UNAIDS epidemiological report of 2013, 39% of the new infections in Uganda and other in other Sub-Saharan countries were among young people between the age of 15 and 24 (UNAIDS 2013).

Furthermore, pregnant adolescent girls are more susceptible to pregnancy- and childbirth-related complications because they have not yet developed the physical maturity required for a healthy pregnancy (Chen et. al., 2006).

The Uganda government survey on demography and health indicates that there is a higher morbidity and mortality rate among pregnant teenagers and their babies than among older women (Republic of Uganda, 2006: 62). The issues are related to HIV/AIDS, STD's, unplanned pregnancies, abortion, contraceptive use, gender-based violence, cross-generational sex, and female genital mutilation. For the youth of Uganda, particularly young women, there is a plethora of adverse health effects caused by under-informed sexual and reproductive health decisions, which has serious implications for the future health and safety of the Ugandan population. The high prevalence of gender based sexualised violence among adolescents in Uganda associated with forced sex, unwanted sexual touches, forced marriage and abortion among young girls than boys. It is estimated that over 20 young girls are defiled every year in Uganda, the trend is on increase (UBOS 2012).

IV. Research Objectives and Questions

The aim of this research is to develop a comprehensive sexuality education (CSE) program targeting young adolescents in primary school in South-Western Uganda. This effort is aimed at improving adolescent sexual and reproductive health of young adolescents through CSE that is led by interdisciplinary university students' team in an environment where no consistent or regulated sexual and reproductive health education program currently exists.

In line with the above project aim, the following specific research objectives have been identified:

1. To assess the current of SRH knowledge, attitudes towards SRH education and SRH behaviors among young adolescents in south western Uganda
2. To examine and understand factors that increase young adolescents vulnerability to SRH risks such as unsafe sex, sexual coercion and early pregnancy
3. To assess (perceived) barriers to implement sexual and reproductive health education at the primary school level in Uganda
4. To develop a gender sensitive comprehensive SRH education for primary school going young adolescents

5. To explore the effectiveness of university students' led SRH education program for primary school going adolescents on young adolescents' sexual health and wellbeing.

The following list of research questions (none exhaustive) will be the focus of the research:

1. What is the state of SRH knowledge, attitudes towards SRH education and SRH behaviors among upper primary school going adolescents in South Western Uganda?
2. What is the linkage between gender attitudes and young adolescents' SRH risks?
3. What are the barriers that inhibit sexual and reproductive health education at the primary school level in Uganda?
4. Who are the SRH stakeholders and what is their focus?
5. How can a comprehensive sexuality education program be implemented in primary schools? What are hindering and enabling factors?
6. How effective is a university led SRH education in mitigating SRH risks?

V. Literature review as per the research objectives

At the United Nations at the International Conference on Population and Development (ICPD) in 1999 governments realized that investing in the health of adolescents is important not only for the well-being of adolescents but also for the current and future well-being of communities and societies (Chandra-Mouli et al, 2015). When young adolescents have access to school based comprehensive sexuality education, they are better able to protect themselves against sexually transmitted infections (STIs), avoid unwanted pregnancy, care for their reproductive health and take advantage of educational and other opportunities that will affect their lifelong well-being. It is thought that this initiative on comprehensive primary school sexuality education would lead to the production of an information (data) base on adolescent sexuality practices and behavioral changes. The outcomes of a gender sensitive and comprehensive SRH school health model will be evaluated and contribute to the body of knowledge since very few comprehensive sexuality education programmes have been evaluated especially in as far as their impacts are concerned.

The current state of SRH knowledge, attitudes towards SRH and SRH behaviors: Assessing the gaps in SRH education

Handling of sexuality education in Ugandan primary school science curriculum focuses mainly on anatomy, changes during adolescence and fertilization, leaving out important aspects such

as gender based violence, prevention of sexually transmitted infections other than HIV, abortions and teenage pregnancy, communication about sexuality, gender equitable relationships, condom negotiation - thus the need to bridge the existing gap. There are also non-curriculum based preventive and health promotion programs such as Straight Talk Foundation and PIASCY (Presidential Initiative on AIDS Strategy for Communication to Youth) have had some coverage in Uganda but there is still challenges of sustainability and their impact in remote areas. PIASCY program focuses mainly on HIV/Aids and abstinence. Some schools offer no sex education, since it remains a controversial issue especially with regard to the age at which children should start receiving such education and the amount of detail to be revealed.

It has further been noted that in Uganda sexuality education has partly been offered through youth centres, the meeting points that offer a youth friendly, safe non threatening environment for information and service delivery across various sectors such as health, education, job training and reaction. However, reviews that were carried out about Youth centres across the globe indicated that these centres were not likely to be a cost-effective way to increase the use of SRHS because of high operating costs associated with provision of multiple (including none health related) services (Denno et al, 2015). Globally, the number of adolescent sexual and reproductive health programmes documented in the literature is substantial, with varied designs, but there are comparatively few at national scale or with reliable periodic evaluation (Haberland et al , 2015)

Following the 2007 global assessment of youth-friendly primary care services that examined the benefits and effectiveness of accessing youth-friendly health services and facilities on health outcomes, a number of conclusions were drawn about the need for stronger research and evaluation. The well-documented barriers faced by young people in accessing services had not been addressed in a comprehensive way, and the evidence for the effectiveness of youth-friendly initiatives was inadequately measured against young peoples' health outcomes. Although utilization had often increased, there was little clear evidence that making services youth-friendly, and securing the investments required to do so, improved health outcomes. The study called for systematic and well-designed interventions with regular assessments, and for interventions to incorporate targets and principles into their design and to assess their strategies against these targets (Report on Programme of Action of the International Conference on Population and Development, 2014).

Indeed in Uganda, whereas Youth Friendly Corners (YFCs) have been formed by Health centers to cater for the needs of adolescents and providing sexuality education, they have been faced with challenges calling for a change of approach in the delivery of sexuality education. And this probably calls for a school based sexuality education program as the best option basing on the teachers' responses above. In the same vein, a study conducted elsewhere in Uganda showed that YFCs were not functioning properly. It was further noted that in the YFCs where equipment has been provided to watch educational films have only been provided on condoms, family planning, HIV/STIs and male circumcision. The young people are now bored with these films and in some instances they have started watching Nigerian films and in other districts they simply watch entertainment films. Indeed as the teachers in Mbarara pointed out, studies also revealed that youth friendly clinics located in HC IVs and district hospitals tend to focus on all health conditions, not only sexual and reproductive health (Homans et al, 2013). It is in the view of the above existing gaps in adolescent sexuality education that this project is being implemented.

Integrating gender-perspective into ASRH in primary schools

A number of funded programs and researchers across the globe have increasingly highlighted gender as a topic integral to comprehensive sexuality education. It should be noted that conventional sexuality education focuses on physiology and sexual and reproductive health, but does not address issues of gender and power. By contrast, comprehensive sexuality education (CSE) focuses on physical, emotional, social and cultural aspects in that, it is gender appropriate, based on human rights of the country, culturally responsive, basing on holistic concept of well being, it accommodates diversity and it is based on unbiased scientifically accurate information that empowers and equips young people with life skills to make autonomous and informed decisions.

One recent review that considered only studies that utilized health outcomes as a measure of impact found that comprehensive sexuality education curricula that emphasized gender and power among other qualities of holistic sexuality education were markedly more likely to reduce rates of sexually transmitted infections and/or unintended pregnancy than “gender-blind” curricula (Haberland & Rogow, 2015). In other words, the conventional programs

though they report a change in a behavioral outcome, they fail to demonstrate a remarkable impact on reducing pregnancies and STIs (Ibid).

Indeed gender empowerment approach to comprehensive sexuality education; since it is directed to handling issues of gender, power and rights, it is likely to have positive outcomes on concerns about early marriage, sexual coercion, intimate-partner violence, homophobic bullying, girls' agency, school safety, sex trafficking, among others.

In underlying the importance of gender in sexuality education, Svanemyr et al (2015) have suggested creating safe spaces for adolescent girls in that social norms and taboos related to gender, sexuality, and SRH issues create a culture of silence, particularly for adolescent girls, in asking, obtaining information, discussing, and expressing their worries about SRH issues. This is particularly the case when it comes to communication with adults in the family or communities. Many girls have limited agency and mobility, few possibilities to express themselves without judgment, and know few persons and places to seek information and support. The lack of a confidential and judgment-free environment can be a barrier to girls obtaining SRH information, learn skills, and feel supported in expressing their concerns related to their lives and SRH issues.

The above findings echo with other evidence on the value of addressing gender norms and relationship dynamics within comprehensive sexuality education. The approach has an explicit gender focus, and addresses gender norms and gender equality as stand-alone topics. For instance in some societies gender norms dictate that girls should marry and begin childbearing in their early or middle teenage years, well before they are physically or mentally ready to do so. Early marriage exposes them to a range of risks including high-risk pregnancies and births, intimate partner violence, and the transmission of HIV (Chandra-Mouli et al, 2015). In emphasizing the dangers of early marriages a Report on Programme of Action of the International Conference on Population and Development (2014) has shown that about 70,000 adolescents in developing countries die annually of causes related to pregnancy and childbirth. Nine of 10 births to girls below age 18 occur within early marriage. Researchers have found that girls who become pregnant before age 15 in low- and middle-income countries have double the risk of maternal death and obstetric fistula than older women (including older adolescents), in particular in sub-Saharan Africa and South Asia.

Gender norms shape the lives of adolescents. These social expectations cover attitudes towards marriage and fertility, including, in some societies, early marriage as it has been noted before, particularly for girls, and in others proof of fertility before unions are formalized. Expectations for male adolescents may include gaining sexual experience as well as proving their fertility. Furthermore social norms that condone violence against women or girls put adolescent girls at risk of pregnancy and sexually transmitted infections, including HIV.

VI. Consequences of inadequate knowledge of sexual and reproductive health information and risky sexual practices among adolescents

A study conducted by Chandra-Mouli et al (Ibid,op cit) revealed that while adolescents generally enjoy good health compared with other age groups, they face particular health risks, which may be detrimental not only for their immediate future but for the rest of their lives; and this therefore calls for a school based sexuality education program to introduce to young adolescents sexuality education so as to secure their future. Many adolescents become sexually active at an early age when they do not know how to avoid STIs and unwanted pregnancies. It has as well been noted that lack of or inadequate reproductive health knowledge is one of the factors indicated in literature contributing to early and unprotected sex and other risky adolescent sexual behavior (Slap et al, 2003)

It has further been noted that lack of knowledge about sex and family planning and the lack of skills to put that knowledge into practice put adolescents at risk for pregnancy. Effective sexuality education is lacking in many countries, including Uganda. The one global measure of coverage related to sexuality education indicates that only 36% and 24%, respectively, of young men and young women aged 15–24 years in developing regions have comprehensive and correct knowledge of HIV/AIDS (WHO, 2012)

The effectiveness of a comprehensive Student led ASRH school model

In the view of supporting a school based sexuality education model, one review of risk and protective factors for ASRH in low- and middle-income countries found out that adolescents currently in school are less likely ever to have had sex compared with those who leave school early. Furthermore, the more years adolescents remain in school, the greater the chances that modern contraceptives would be used (Svanemyr et al, 2015)

This student led intervention reflects on the views proposed by Villa-Torres et al (2015) on youth's right to participation and promotion of youth leadership in the development of sexual and reproductive health policies and programs express how SRH programs for youth and youth-led organizations have flourished and that a handful of studies have documented and evaluated youth participation as a component of SRH programs, and ultimately, a key component to achieve program outcomes. The assumption is that university students, are young people who can easily relate with the young adolescents in primary schools and that a higher level of trust will allow open discussions of sensitive topics, allowing for information to flow in both directions. While university students are about 10-15 years older than the primary school children, they have an advantage because they are still quite young and may more easily relate to the young children than adults. This arrangement of having the sexual and reproductive health education led by university students may be considered to be alternatives to the top-down adult-led health promotion interventions because they viewed to led to promotion of better communication with young people and ensure their effective participation

VII. Research Setting

The research will focus on Mbarara District in South western Uganda. The study data will be collected from selected primary schools in Mbarara District South-Western Uganda. South Western Uganda is which comprises of 9 districts including Mbarara District where the study will be conducted. Mbarara District consists is subdivided on 02 Counties and 01 Municipality as the local government administrative units. The Counties and the Municipality are subdivided into of 14 sub-counties and 4 divisions respectively. A Sub-county is 3rd lowest local government structure of a district while a Division is equivalent to a sub-county but for municipalities and cities. According to the 2015 District Education reports, Mbarara has a total number of 248 primary schools with an estimated primary school enrolment of 80,924 (Mbarara District Local Government 2015). The project will be implemented in the 6 sub-counties/divisions closest to the MUST campus.

VIII. Methodology

The study will use a cross-sectional study design to be able to examine the impact of a comprehensive sexual and reproductive health education program in mitigating young

adolescents SRH risks. A Multi-stage stratified sampling method will be used to determine sub-counties and schools for the study. With an estimated 123 pupils within P5-7 per school based on a 35% average estimate (UDHS 2011), a total of 33 Schools will be considered within the 18 sub-counties/divisions of Mbarara district. A pilot study will be conducted prior to the baseline study to test the survey and estimate intra-cluster correlation for the sample size calculation. The pilot study will be conducted in 8 schools, in urban area and in a rural area. The selection of participating schools will be determined by acceptability of school to the programme.

Study procedures

- Year 1: baseline assessment (IR1) and development of the intervention (IR2) (primary/grade 4, 5, 6 and 7)
- Year 2-3: implementation and monitoring of the intervention (IR3) (primary/grade 5, 6 and 7)
- Year 4: effectiveness study (IR3) and dissemination (IR4) (primary/grade 6 and 7)

Intermediate results:

IR1 and IR3 are distinct research activities and will be elaborated further.

IR1: The gaps in SRH education are assessed:

The baseline assessment consists of three main parts:

- A survey for the study population. This survey has the objective to assess the current state of SRH knowledge, attitudes towards SRH and SRH behaviors. The survey will also include questions on current sexuality education, on where the study population seeks and finds information on SRH and their preferred sources for and methods to learn about SRH. We will do this survey among students from grades 5, 6 and 7. The responses of students from grade 4 will be used as a baseline for the longitudinal effectiveness study (see further).
- A qualitative assessment of perceived barriers to implement a comprehensive SRH school model. We will interview the main stakeholders: young adolescents, their parents, teachers, school principals, community leaders, religious leaders, district health and education officials, and policy makers.
- A desk study on current initiatives on SRH for early adolescents in Uganda, sub-Saharan Africa and other countries. It will also study the Ugandan laws and regulation on this and related topics.

IR2: Develop an interdisciplinary ASRH school model with integrated gender-perspective for young adolescents in primary schools.

Information generated from the SRH Education gap assessment will serve as the basis for the development of a gender-sensitive comprehensive SRH school model based on an explicit theory of change. The technical content and the social ramifications of said content will be constructed and overseen by faculty and students from both the medical and social science areas in a comprehensive approach geared toward creating a socially and gender sensitive yet medically impactful curriculum.

We will set-up a community advisory board that includes all main stakeholders that will be consulted to provide advice and input in the process of development and implementation. Before implementation, the curriculum will be presented and screened by students, parents and teachers including the community advisory board to ensure appropriateness and applicability of the curriculum. The premise behind such a collaborative approach is that offering all stakeholders a platform for offering their input on sexual and reproductive health is necessary to ensure sustainability and social acceptance. Establishing a curriculum will allow for continuity in application of the subject material across schools and districts.

IR3: The effectiveness and enabling/hindering factors in the development and implementation of the ASRH school model are studied

We make a distinction between two research methods in the IR: identifying enabling/hindering factors through process analysis and studying effectiveness using a cluster-randomized design.

- Identifying enabling/hindering factors

The project includes close monitoring of the development and implementation of the comprehensive SRH school model. Often effectiveness studies of comprehensive SRH education find little impact of their efforts, and development and implementation issues are often pointed to as the reason for this limited effectiveness. Nevertheless the latter issues are hardly ever studied independently.

We want to fill this void by performing a process analysis of the development and implementation of the comprehensive SRH school model. All steps in the development will be clearly documented. The research team members will develop monitoring sheets that keep track of the implementation of the project. The monitoring sheet will be filled by the local

research team based in Mbarara and on a monthly basis will interview the a selected group of participating students (educators – university students, and the leaners – primary school students) and teachers to respond to a set of monitoring questions on the process of the program. Furthermore, we will perform interviews and focus group discussions with the project coordinators, implementers and other relevant stakeholders to gain insights in their perceptions of the ASRH school model, its strengths and weaknesses.

- Effectiveness study

The effectiveness of the project will be studied using a cluster-randomized pre-test post-test design. We will study whether the changes that have taken place of a two-year implementation of the ASRH school model are different in the intervention and control schools. This will be done using the same questionnaire as in the baseline study. The main outcomes are SRH knowledge, attitudes towards SRH (including gender norms) and SRH behaviours. Furthermore, the survey will include additional questions to assess the students' appreciation of the ASRH school model.

The intervention

The intervention for the study will be a university student led delivery of comprehensive sexuality education (CSE) modules in 15 primary schools in rural and urban setting in a period of one year. The modules will be developed in consultation with the existing upper primary school curriculum for Uganda, the international guidelines on sexuality education (UNESCO and UNFPA). They will be carefully reviewed by experts on the study team as well as approval from a community advisory board comprised of community and religious leaders, teachers and policy makers from ministry of education and health.

The list of modules will include

- 1) Introductory modules to facilitation
 - School entry process
 - Facilitation skills
 - Adolescent development
 - Values clarification
- 2) CSE core modules

CSE core modules

	Puberty
	Relationships and emotions
	Decision making
	Self esteem
	Know your rights
	Crossing the line (sexual violence and reporting)
	Being a boy or a girl (Gender and Sexuality)
	Reproduction
	Sexually transmitted diseases
	HIV/AIDS and Stigma
	Sexuality and media

Delivery of modules

University students offering programs in Bachelor of gender and applied women health, Bachelor of medicine and surgery, Bachelor of Nursing Science and Bachelor of Community Planning and Deveopment will apply as volunteer student educators. An advertisement for student educators was put on Mbarara university website on (<http://www.must.ac.ug/news/call-young-adolescent-sexual-and-reproductive-educators>) on 7th March 2016

IX . Sample Size Estimation

School selection, sample size estimation and school entry processes

School mapping; In December 2015, researchers accessed lists of all schools in Mbarara district from the Mbarara district Education office. This list had contacts of head teachers and enrollment in schools. A team of field assistants visited schools and called head teachers to update the school enrollment in February 2016.

A pilot survey was conducted in March 2016 and results were used to estimate the design effect and intra class correlation required sample size for the cluster randomized trial. A total sample size of 846 was determined, to measure a difference of 10% between groups (reference 50%) with a power of 90%. With an estimated drop-out rate of approx. 20% we opted

for a total sample size of 1100 students. A sample of 1100 pupils was needed from 33 schools (clusters). Schools were selected by a weighted excel selection system randomly from a list of 220 schools in urban and rural areas of Mbarara district having eliminated schools which did not have upper classes. A local statistician assigned schools randomly to intervention and control arms. Finally 15 schools were selected as intervention schools. Only 2 schools of the 15 are in the urban area.

Field workers visited intervention schools with letters drafted by the principal investigator asking for permission to having the training programs in the schools and their commitment to oversee the training activities in the schools. All the head teachers in the 15 schools confirmed participation and signed the letters of acceptance. They were further invited for a joint meeting with the advisory board at Mbarara University in July 2016

X. Analysis

The qualitative data will be transcribed and if necessary translated into English. Analysis of the qualitative data will be done by two independent researchers using a coding tree that was jointly developed after preliminary analysis. The analysis will be done in ATLAS TI.

Analysis of outcomes for effectiveness of the intervention

Statistical analyses will be conducted using Stata® (College Station, Texas, USA). All outcome variables will be analyzed as ordinal categorical variables, with the exception of sexual behavior which was analyzed as a binary variable. An interaction variable will be created using the round variable (baseline vs endline) and study arm variable (intervention vs control). We will use an ordered logistic regression to compare differences in the change from baseline to endline between the intervention and control arms, also known as the “difference in differences” method Outcome measures

Sexual and Reproductive Health Knowledge

SRH knowledge was measured based on knowledge of puberty, HIV/STIs and pregnancy prevention. This included knowledge on how HIV/AIDS can be acquired (score 0-4), types of common Sexually Transmitted Infections (score 0-4), knowledge of pubertal changes in boys

(score 0-6.) and in girls (score 0-7), and knowledge about ways to prevent pregnancy (score 0-4).

Sexual Wellbeing and Attitudes

Self-esteem scores were estimated using the Rosenberg (1965) self-esteem scale. Body image scores were estimated using 5 of the 6 items of the Body Image States Scale (BISS-6). Gender equitable norms scores were estimated using 11 items. Six of these items were adapted from the Attitudes towards Women Scale for Adolescents (AWSA) and 5 items were developed to suit the respondents' age and the Ugandan context.

Sexual Behavior

Sexual behavior was defined as experience with consensual heterosexual intercourse. Owing to the fact that we were dealing with very young adolescents, interviewers selectively asked questions about sexual activity to only participants who reported that they had been to a private place with a peer of the opposite sex. RAs defined sexual activity for pupils using simple, age appropriate terms. Sexual behavior was then classified using a binary yes/no question regarding engagement in sexual activity prior to the study or within the intervention year.

Other variables

We assessed relevant pupil characteristics including age, gender, socio-economic status, orphanhood status and truancy. A socio-economic score was developed based on household water source, distance from water source, household possessions and pupil possessions including shoes and pairs of school uniforms, as we described previously. We also assessed truancy, which was defined as missing school for any reason other than illness. We selected individual and interpersonal variables that could affect the key outcomes among very young adolescents.

An interaction variable was created using the round variable (baseline vs endline) and study arm variable (intervention vs control). We then used an ordered logistic regression to compare differences in the change from baseline to endline between the intervention and control arms, also known as the “difference in differences” method. We will conduct both a univariate analysis and a multivariate analysis controlling for key covariates, including age, gender, school location (rural vs urban), truancy, and orphanhood. We will conduct a second multivariate analysis splitting the groups by gender, to assess whether there was a difference in the treatment effect between boys and girls.

XI. Ethical Issues

There are no medical risks in this study; the main anticipated risk is an increased discussion of sexuality and adolescent vulnerabilities which will increase young adolescent's awareness of matters that are not commonly discussed in their immediate communities. Participation in the study is voluntary and participants will be given a chance to refrain from answering questions they do not feel comfortable with and will be at liberty to withdraw from the study. Written informed consent will be obtained from the parents and guardians or caretakers of all the young adolescents in the target class before their selection and the purpose of the study will be thoroughly explained to the parents in the form. However, because of the difficulty of obtaining written informed consent from each parent/guardian, the approved procedure for obtaining consent will be in such a way that the head teachers will consent on behalf of adolescents whose parents will not have been reached and those whose parents who will not have returned the signed consent forms.

While all students in the upper primary of the selected schools will participate in the survey and intervention activities, all data will kept anonymous i.e. codes not names will be used to for data entry. There will not be any financial benefits for participation in the study, all benefits are educational.

If intervention prove effective, it will be integrated in the students' outreach activities of the university to allow implementation in other schools in the country.

The study will seek ethical approval of the South host Institution – Mbarara University of Science and Technology and the Uganda National Council of Science and Technology. The study will abide by the ethical standards of the two institutions plus Ethics Committee of Ghent University Hospital and Free University of Brussels.

XII. Expected outputs and Dissemination

The first tangible output of the project is construction of data base on primary SRH education practices, enabling factors and gaps.

The second output will be a gender sensitive and comprehensive SRH school health model and an established university led SRH curriculum for young adolescents.

We expect that this project will generate enough data and findings for two doctoral dissertations. One will be done within the Faculty of Medicine and Health Sciences at Ghent University, the other one in the Faculty of Arts and Philosophy of the Free University of Brussels. Both candidates will contribute to the further strengthening of Mbarara University's SRH related research capacity.

XIII. Selected Literature Sources

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